

CLAIMS

1. A control method of premix compression self-igniting internal combustion engine for premixing air and fuel in a combustion chamber, and self-igniting the mixture by
5 compression, comprising the steps of temporarily reopening an exhaust valve in compression stroke, freely varying the reopened valve closure timing, and changing the effective compression ratio to an effective compression ratio capable of obtaining an optimum self-ignition timing in each
10 operation region.

2. The control method of premix compression self-igniting internal combustion engine of claim 1, wherein the reopened valve closure timing is controlled so as to heighten the
15 effective compression ratio in a small load operation region, and lower the effective compression ratio along with the increase of load.

3. The control method of premix compression self-igniting internal combustion engine of claim 1, wherein a reopened
20 valve closure timing map is compiled by describing the valve closure timing for obtaining an optimum ignition timing in each operation region depending on the engine speed and load, the engine speed and load are detected during
25 operation of the engine, and the reopened valve closure

timing is varied on the basis of the valve closure timing map.

4. The control method of premix compression self-igniting
5 internal combustion engine of claim 1, wherein the fuel
injection start timing is delayed from the reopened valve
closure timing.

5. The control method of premix compression self-igniting
10 internal combustion engine of claim 1, wherein the engine
includes an EGR device, and EGR rates are detected, and
thereby the effective compression ratio is heightened by
advancing the reopened valve closure timing in an operation
region of high EGR rate, and the effective compression
15 ratio is lowered by retarding the reopened valve closure
timing in an operation region of low EGR rate.

6. The control method of premix compression self-igniting
internal combustion engine of claim 1, wherein the intake
20 air temperature is detected, and the effective compression
ratio is lowered by retarding the reopened valve closure
timing when the intake air temperature is high, and the
reopened valve closure timing is advanced when the intake
air temperature is low.

7. The control method of premix compression self-igniting internal combustion engine of claim 1, wherein the cooling water temperature is detected, and the effective compression ratio is heightened by advancing the closure timing of the reopened exhaust valve when the cooling water temperature is low, and the reopened valve closure timing is retarded when the cooling water temperature is high.

8. The control method of premix compression self-igniting internal combustion engine of any one of claims 1 to 7, wherein knocking or other abnormal combustion is detected by an abnormal combustion detection sensor, and the reopened valve closure timing is retarded in the event of abnormal combustion and controlled to be changed to a highest effective compression ratio in a range not to cause abnormal combustion.

9. The control method of premix compression self-igniting internal combustion engine of any one of claims 1 to 8, wherein a limiting effective compression ratio map for suppressing the maximum cylinder internal pressure within an allowable range in each operation region is compiled, and the reopened valve closure timing is set so as not to exceed the limiting effective compression ratio in each operation region.